Cleaning up coal in West Texas expected to help - San Antonio Current (TX) - October 24, 2012
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There's a mean-sounding hiss emanating from one of a dozen pipes rising like stovepipe to feed into a desert-tan battery that intermittently flushes high volumes of fluids 4,500 feet below ground. Larry Pickerel, the robust production foreman for Legato Resources, explains how valves on the water-alternating-gas wellhead skid — as the installation is known — are wrenched open or shut to flood nearby oil wells with either water or carbon dioxide. "We don't run the CO2 consistently, we have to decide on a pattern," Pickerel says.

This particular oilfield has already been tapped and water flooded multiple times to bring more oil to the surface. But it's the CO2 pipelined down from Colorado that acts as a prized lubricant and loosens up the hardest-to-reach dregs. It's such a common resource here in West Texas that there are 3,200 miles of pipeline dedicated to it. "We use a seismograph to see where the CO2 is going because it's very valuable and we don't want to waste it," adds Bob Kiker, president of Applied Petroleum Technology Academy.

More than an oilfield lubricant, CO2 is also considered one of the most significant of greenhouse gases responsible for increasingly destabilizing the planet's climate as industry emissions accumulate in the atmosphere. To avoid the worst of global warming, scientists suggest that greenhouse gases, now tracking at 390 parts per million, need to be caught before they hit the 450 ppm mark. (Though, considering that these gases have generally stayed below 300 ppm for most of human history, a safer recipe would involve a rapid retreat to 350 ppm, others say.) To accomplish either goal will require the rapid shutdown of polluting technologies or the rapid deployment of new technologies to capture and store those greenhouse gases already being blamed for a portion of our recent extreme weather events.

An extraordinary — and extraordinarily expensive — coal plant expected to break ground next year a few miles west of Odessa could be part of the answer to stalling and reversing greenhouse emissions.

Odessa Chamber of Commerce President Mike George likes to refer to this blue-collar oil town as the "Clean Energy Capitol" of the United States. That's not due to the oilfield service trucks rumbling in every direction servicing a boom in oil and gas production that has sent hotel rooms here north of $250 a night. It's certainly not the myriad of wells marked by flame-tipped flares with the rotten-egg odor of hydrogen sulfide wafting. What has George so excited is the $2.5 billion coal gasification plant that may well be the first of its kind when completed. The director of projects for **Summit** Energy **Group**'s Texas Clean Energy Project, former Dallas Mayor Laura Miller, says the intention of the project is to "raise the bar forever so nobody can ever build a dirty coal plant again."

This 400-megawatt project is an example of what the federal government or coal lobby would term a "clean" coal plant. It will collect a full 90 percent of its carbon dioxide gases — an expected 2.5 million tons per year — to sell into the oil patch for oil recovery. By separating hydrogen out from the CO2, TCEP will also be able to create a stream of urea to be sold as fertilizer to the tune of 700,000 tons a year. In fact, the fertilizer is the money maker here, according to Miller. After that in profitability terms comes electricity sales, followed by CO2 sales. Lastly, an estimated five percent of the company's revenue is expected to come from the sale of sulphuric acid, argon gas, and "inert non-leachable slag." Don't call TCEP a **power** plant, this is a "polygen" plant, producing a number of marketable streams that at day's end make the carbon capture process cost efficient.

Meanwhile, the waste air emissions will add up to less than a typical gas-fired plant, and most of the heavy metals — including the neurotoxin mercury so typical of traditional coal plants — will be "vitrified," turned into glass beads that could then be potentially disposed of by mixing it into construction concrete.

San Antonio's CPS Energy signed a 25-year **Power** Purchase Agreement for 195 megawatts from the plant as part of its ongoing attempt to replace dirtier sources of energy such as the 871-megawatt J.T. Deely coal plant, set to be decommissioned by 2018. After a previous leadership promised scrubbers to clean up the pollution at Deely, CPS Energy CEO Doyle Beneby decided to close the plant early instead, saving an estimated three billion in needed retrofits. In the past year, CPS has also purchased an 800-megawatt gas-fired **power** plant and signed a PPA for 400 megawatts of new solar **power**.

Though research into capturing carbon from **power** plants has been going on for years, TCEP could be the first full-scale coal plant to utilize CCUS, that is: carbon capture, utilization, and storage. The support behind the federally supported effort to clean up coal is diverse, including a number of environmentalists as well as the captains of the coal industry, people who recognize that — in spite or because of the accumulating dangers poised by climate change with each year of federal inaction — coal **power** makes up a full half of the electricity produced in the U.S. today and 27 percent of all the climate-destabilizing greenhouse gases released by the nation, according to the Center for Climate and Energy Solutions.

"I want to save the polar bears and my boss, [**Summit Power** Board Chairman] Don Hodel, wants to save coal," Miller said. "We come from very different perspectives. One of the reasons this project is so successful is because it's very bi-partisan. ... People from all different philosophies understand this project."

Of course, there are those who understand it and still don't entirely embrace it. "There is no such thing as 'clean' coal," said Tom "Smitty" Smith, executive director for Public Citizen of Texas. "Coal still has to be mined, and that puts out a tremendous amount of greenhouse gases." Yet the technology has support at the federal level: a full $450 million of development funding has been committed to TCEP from the U.S. Department of Energy. A deal signed at a recent San Antonio energy forum with the Chinese **Sinopec** Engineering **Group**, a relationship that brings with it a billion dollars from the Export-Import Bank of China, delivered what is expected to be the project's sole lender.

But the venture will only be successful — from a climatic perspective — if the CO2 stays where it is put. To address that variable, UT's Bureau of Economic Geology's Gulf Coast Carbon Center has been watching several oilfields in Texas and along the Gulf. One, known as SACROC, in Scurry County has been flooded with CO2 since the late 1970s. "We started with some skepticism about a decade ago, not sure that [carbon sequestration] was a great idea," said Susan Hovorka, principal investigator at the GCCC. "And we've now finished five and started two field tests and they've been surprisingly affirmative."

Hovorka said the **group** assumed at first that since the CO2 had been injected for decades by a petroleum company under no obligation to make sure the carbon dioxide stayed in place that there would inevitably be some leakage. The other assumption was that if the CO2 was moving back to the surface it would first hit the aquifer, leaving traces of its presence in acidified water. They found none of that. "We like to say in a nuanced way, because we're researchers, that we don't know that there's no leakage," Hovorka said, "but there's no leakage there that has reached the aquifer at a detectable level." Investigations at SACROC continue.

Assuming the plant's water demands for between 4 and 5 million gallons per day are met (the DOE's environmental assessment talks about pipelining wastewater from nearby Midland, but company officials are now talking about building a desalination unit), the plant could be a winner.

What has critics of "clean" coal concerned is the potential for the movement to lead to the construction of a new generation of coal plants instead of an aggressive campaign to shut down or retrofit existing plants. "I hope carbon capture sequestration works. We need it," said Don Brown, associate professor of environmental ethics, science, and law at Penn State. "The real problem with it is, I think, that the same people in the coal industry supporting carbon capture and storage are fighting other forms of energy that could solve climate change.

"The scientists say that we're running out of time right now, that the whole world needs to reduce emissions by 25-40 percent to have any hope of stabilizing CO2 in the atmosphere at 450 parts per million. Unfortunately the coal industries are also fighting cap and trade."

That resistance to cap and trade hasn't blocked the coal industry from the federal trough, though. In the battle for subsidies, all energy sources have a place at the table — though some portions have gotten considerably larger in recent years thanks to President Obama's American Recovery and Reinvestment Act of 2009. Between 2007 and 2010, the total amount of energy-related subsidies climbed from $17.9 billion to $37.2 billion.

While presidential hopeful Mitt Romney would have us all believe the majority of the subsidies have gone into failed solar ventures, a la Solyndra, the biggest chunk of the pie in that 2010 buildout actually went to developing energy sources such as biofuels ($6.6 billion), wind **power** ($5 billion), and coal ($1.3 billion),

according to the U.S. Energy Information Administration. (Solar got $1.1 billion that year.)

And while solar proponents declined to take pot shots at coal's continued subsidies, a report prepared for the Solar Energy Industry Association by researchers at the Howard H. Baker Jr. Center for Public Policy at the University of Tennessee did their work for them by suggesting federal investment priorities may be skewed. "From an economic development perspective, a portfolio of incentives weighted towards mature industries will tend to insulate and maintain those profitable industries and suppress new industries, while a portfolio weighted towards industries in the adoption stage will tend to advance adoption of new industries," reads the report "Assessment of Incentives and Employment Impacts of Solar Industry Deployment."

"Since history shows that new industries are the source of growth in an economy and mature industries tend to either maintain or lose jobs over the long term, effective incentives from an economic standpoint are those that address industries in the early adoption stage," meaning solar.

Trickier than bagging federal subsidies, however, is bringing the product to market. It's been a decade since a federal "clean" coal research plant dubbed FutureGen was announced by President George W. Bush. Defunded by the U.S. Department of Energy after cost overruns soured that administration, FutureGen has been picked up by the Obama administration and moved from Texas to Illinois. It has yet to break ground. Meanwhile, national energy demand has leveled off as the country's gas boom has dramatically undercut coal **power** prices sending dozens of coal plant plans to the scrap heap in recent years. For those reasons, TCEP's advance with Chinese backing surprised many. In a September market analysis, Chris Flavin at the Worldwatch Institute wrote, "Those who were betting on a big future for coal, including the future addition of costly carbon capture and storage technology, may want to rethink their plans."

While TCEP is certainly in the vanguard of the technology, Miller sees this as a "now or never" moment. "If we're not going to start capturing carbon now, when are we going to do it?" Miller asked. "The thing that really troubles me ... what's going to happen if none of these carbon-capture projects that are on the boards right now get built? How many more decades will we have to hear that 'Oh well, carbon-capture doesn't really exist. They tried and they failed. It's too expensive. The science isn't ready.' Then the average citizen will believe that you can't do carbon-capture, which is not true."

Farmers and oilfield operators will undoubtedly appreciate a closer source of fertilizer and CO2. Those concerned about our weirding weather will appreciate the sequestered carbon. But the irony of CO2 being sequestered even as it elevates more crude that will inevitably lead to the release of more greenhouse gas isn't lost on anyone. Neither is the big picture when it comes to coal.

"With new coal plants there is no way to meet the climate reductions that are needed," Public Citizen's Smith said. "So we're going to have to go on a campaign to retire these old coal plants."

As J.T. Deely has already been nominated, why not start there? And with so many alternative sources online or scheduled already for San Antonio, why wait?

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